DRAPAL, Ales, SYRBU, Parascovia. Middle Bruck Loops and the Total Multiplication Group. In: *Results in Mathematics*, 2022, nr. 4(77), p. 0. ISSN 1422-6383. DOI: 10.1007/s00025-022-01716-2

Let Q be a loop. The mappings $x\mapsto ax$, $x\mapsto xa$ and $x\mapsto a/x$ are denoted by L_a, R_a and D_a, respectively. The loop is said to be middle Bruck if for all $a, b\in Q$ there exists $c\in Q$ such that $D_aD_bD_a= D_c$. The right inverse of Q is the loop with operation $x/(y\backslash 1)$. It is proved that Q is middle Bruck if and only if the right inverse of Q is left Bruck (i.e., a left Bol loop in which $(xy)^{-1}= x^{-1}y^{-1}$). Middle Bruck loops are characterized in group theoretic language as transversals T to $H\leq G$ such that $\langle T\rangle = G$, $T^G= T$ and $t^2= 1$ for each $t\in T$. Other results include the fact that if Q is a finite loop, then the total multiplication group $\langle L_a, R_a, D_a; a\in Q\rangle$ is nilpotent if and only if Q is a centrally nilpotent 2-loop, and the fact that total multiplication groups of paratopic loops are isomorphic.